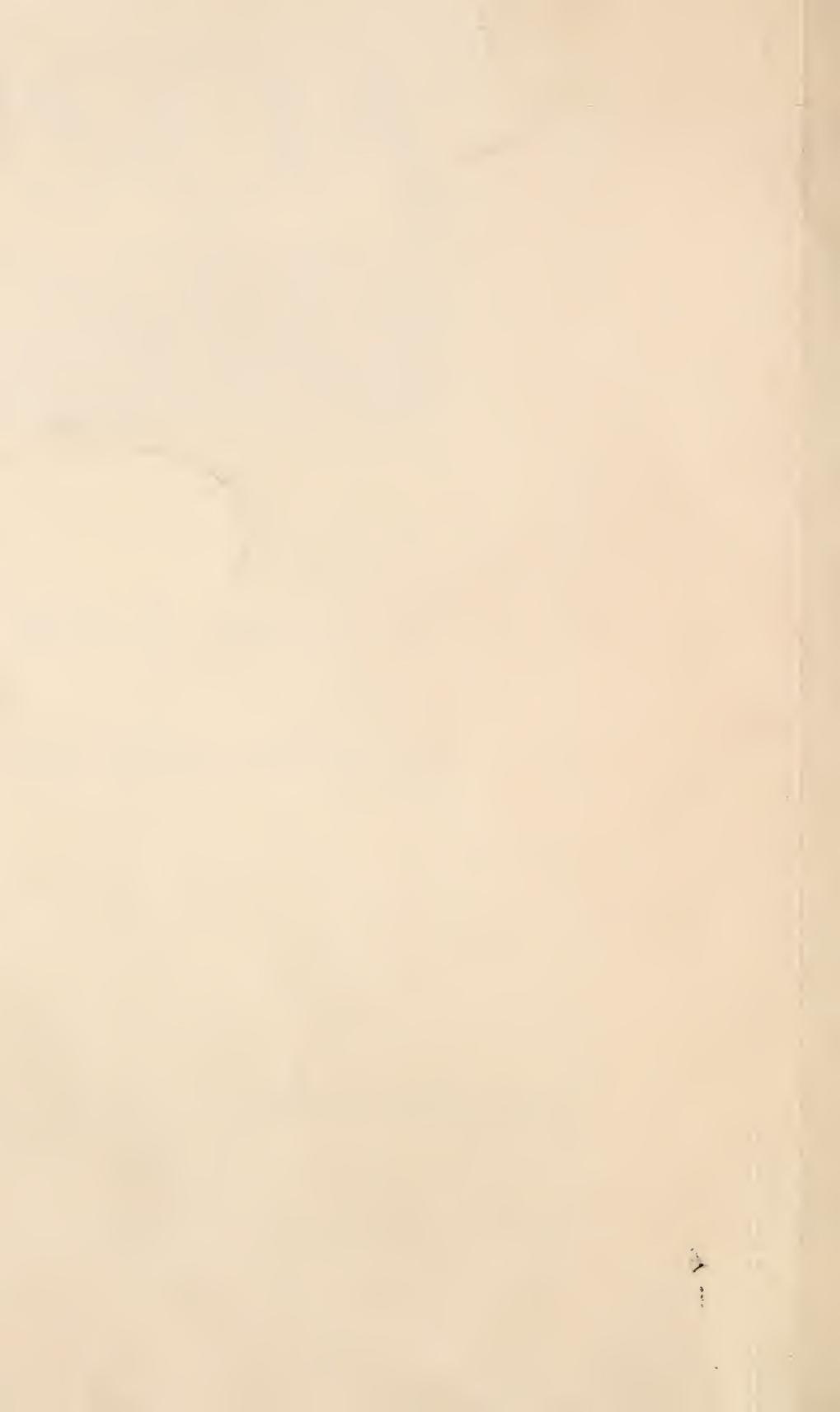


Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



4280.39
A981M
Cop. 2

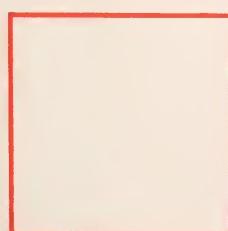
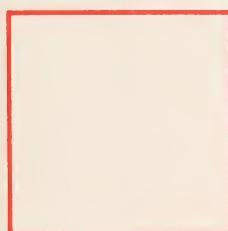
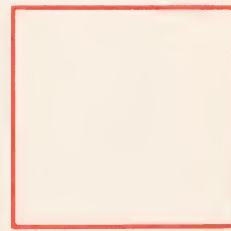
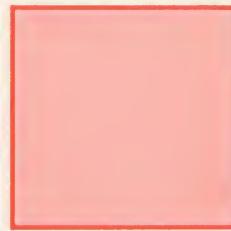
#57

w Fresh Tomatoes are Marketed

U.S. DEPARTMENT OF AGRICULTURE
U.S. BUREAU OF AGRICULTURAL MARKETING SERVICE

FEB 1 1977

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING BULLETIN NO. 59



CONTENTS

Introduction	2
Supplies, Prices, and Marketing	2
U.S. Production	2
Seasonal Availability	5
Foreign Trade	7
Total Supply	7
Prices	8
Marketing Practices	9
Harvesting	9
Packinghouse Operations	11
Market Channels	13
State Industries	15
Florida	15
California	19
New Jersey	21
South Carolina	23
Alabama	24
Michigan	24
Texas	24
Virginia	25
Arkansas	25
New York	26
North Carolina	26
Greenhouse Tomatoes	27
Imports	27

October 1976

☆ U.S. GOVERNMENT PRINTING OFFICE : 1976 O-219-104

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 90 cents

Stock No. 001-000-03591-6

There is a minimum charge of \$1.00 for each mail order

How Fresh Tomatoes are Marketed

By James V. Fahey, Agricultural Economist, Fruit and Vegetable Division,
Agricultural Marketing Service

INTRODUCTION

Fresh tomatoes are available year-round in the United States, and are a good source of vitamins, particularly A and C. They also contain some minerals and have few calories—a 5-ounce tomato contains about 35 calories. Many varieties of tomatoes are grown for fresh market sale. These include cherry, round, and pear-shaped tomatoes in various shades of red or yellow. Those most commonly found in retail stores are pink or light red, round, and average about 3 inches in diameter.

U.S. grown tomatoes account for the major portion of commercial supplies throughout the year, though imports are an important source during the winter and spring. The typical consumer uses about 12 pounds of commercially grown tomatoes each year. Home gardens furnish a substantial quantity.

The commercial fresh tomato crop requires less than one-half of one percent of the Nation's cropland. Tomatoes are produced in all States, but most originate in just a few. To mature from seed to harvest takes about 80 days. Successful commercial production requires warm temperatures, fertile soils, adequate moisture, and effective pest control. An ample supply of field labor is essential since fresh market tomatoes still must be harvested by hand.

SUPPLIES, PRICES, AND MARKETING

U.S. production

The tomato is a leading fresh market vegetable with an average (1972-74) annual production of 2 billion pounds valued at \$317 million. Over the past decade U.S. total tomato acreage has declined by one-fifth (fig. 1).

U.S. TOMATO HARVESTED ACREAGE

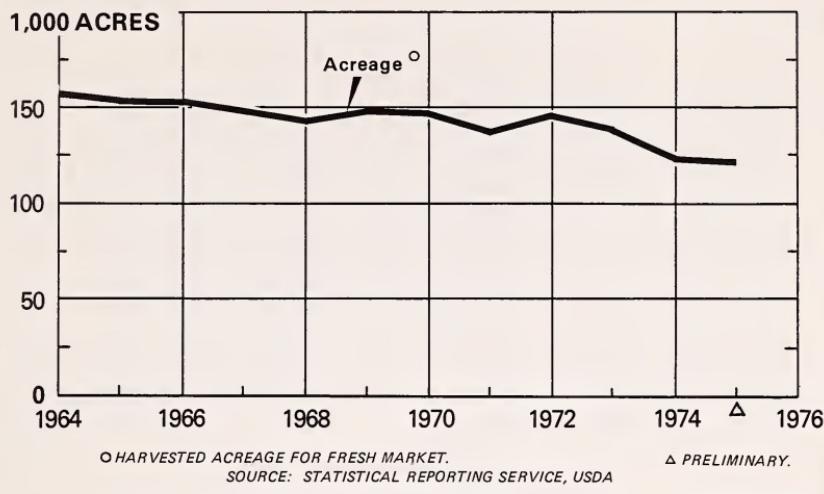
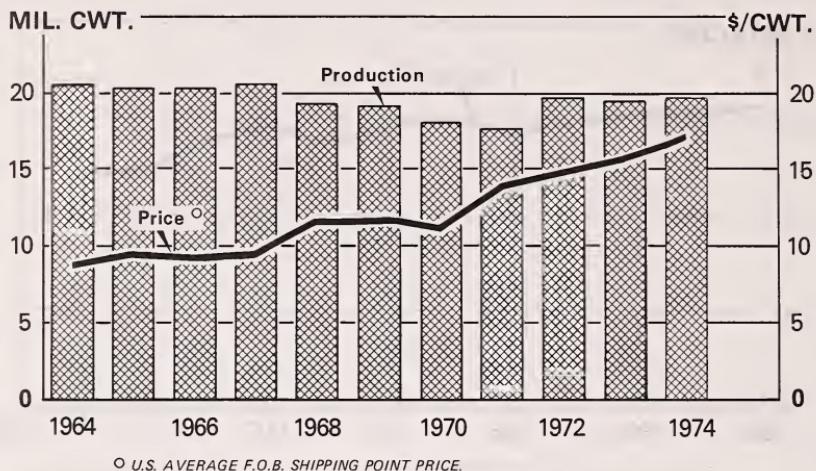


Figure 1

Production showed a moderate decline between 1964 and 1971 primarily due to a reduction in Florida's output. Producers in that State curtailed acreage because of increasing competition from imported tomatoes. In addition, bad weather caused heavy crop losses in the 1969-71 period. Florida's production has increased during the last few years, and U.S. tonnage is up (fig. 2). Total U.S. output in 1972-74 was 11 percent above the low point in 1971, but 3 percent below the 1964-66 average.

Over the last few decades, production has become more concentrated geographically. During the 1950's, California and Florida each produced about one-fourth of the U.S. output. By the mid-1970's, these two States were each providing one-third of the domestically grown supplies (Table 1). Of other producing States, New Jersey and South Carolina each grew about 3 percent, and Alabama, Michigan, Texas, and Arkansas produced 2-3 percent. Another 18 States (each furnishing less than 2 percent of the annual total) accounted for the remaining 16 percent of the U.S. fresh market crop.

U.S. TOMATO PRODUCTION AND PRICE



○ U.S. AVERAGE F.O.B. SHIPPING POINT PRICE.
SOURCE: STATISTICAL REPORTING SERVICE, USDA

USDA

NEG. AMS 658-75 (10)

Figure 2

Census data show that the number of farms growing tomatoes has declined sharply. Since those data do not distinguish between production for fresh market and processing, it is impossible to determine the changes by type of outlet. An indication of the trend is apparent in Florida where growers plant for fresh market sale, even though some tomatoes are salvaged for processing. About 900 farmers reported sales of fresh tomatoes in 1959. The number of farms was down to 373 in 1969, and there were only about 100 commercial growers in 1975.

Table 1. Fresh Tomatoes: Commercial production by States and percentage of total, 1972-74 average

State	Average production 1972-74	Percentage of total
	1,000 cwt.	Percent
Florida	6,881	34.8
California	6,861	34.7
New Jersey	585	3.0
South Carolina	575	2.9
Alabama	562	2.8
Michigan	430	2.2
Texas	429	2.2
Arkansas	388	2.0
Virginia	332	1.7
New York	331	1.7
Indiana	283	1.4
Tennessee	282	1.4
North Carolina	272	1.4
Pennsylvania	252	1.3
Maryland	231	1.2
Ohio	192	1.0
Georgia	183	0.9
Massachusetts	133	0.7
Connecticut	88	0.4
Louisiana	80	0.4
Kentucky	80	0.4
Missouri	75	0.4
Illinois	72	0.4
Washington	72	0.4
Colorado	72	0.4
Hawaii	40	0.2
United States	19,778	100.0

Note: Data do not add to totals due to rounding.

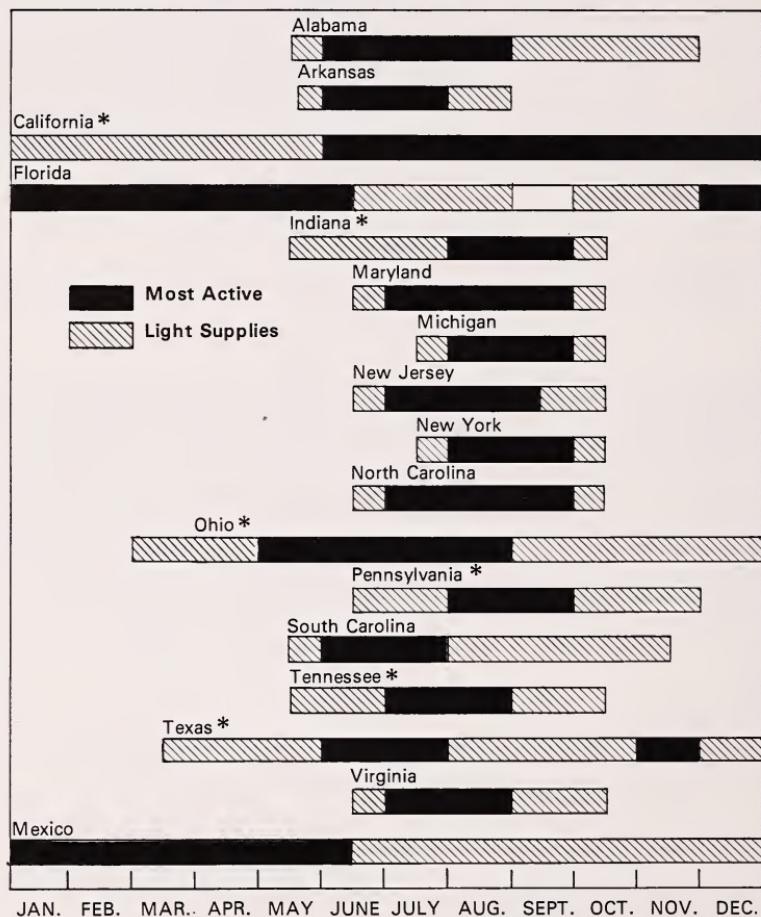
Seasonal availability

Supplies of commercially grown tomatoes, as indicated by supplies in major wholesale markets, are lowest in December. Florida produces most of the fresh supply that month.

Supplies continue low into mid-winter, but increase during March as temperatures moderate in Florida and Mexico. Shipments hit a seasonal peak in June when harvest is active in California and several southeastern States. Commercial movement is large, but somewhat lower through the summer season—from July until first

frosts in September—with competition from substantial quantities of home garden tomatoes and other fresh vegetables and fruit. Supplies vary greatly year to year, largely because of weather. During 1974, weekly supplies in 41 leading wholesale markets varied up to 42 percent, and for the year, averaged 11 percent. The seasonal availability of supplies in principal producing States and Mexico is shown in figure 3.

FRESH TOMATOES: SUPPLY SOURCES BY MONTHS



*INCLUDES SPRING AND FALL GREENHOUSE PRODUCTION.

SOURCE: FRESH FRUIT AND VEGETABLE UNLOAD TOTALS, AGRICULTURAL MARKETING SERVICE, USDA.

Figure 3

Foreign trade

The United States runs a deficit in foreign trade in tomatoes with imports outweighing exports about 6 to 1 (fig. 4). During the mid-1960's, imports of fresh tomatoes amounted to about 290 million pounds annually. However, there was a dramatic increase to a record 753 million pounds in 1973. Total import volume declined in 1974 as a result of a production cutback and export controls in Mexico, the principal foreign supplier to the United States.

U.S. tomato exports go primarily to Canada. About 100 million pounds were exported in 1964, and 161 million in 1974.

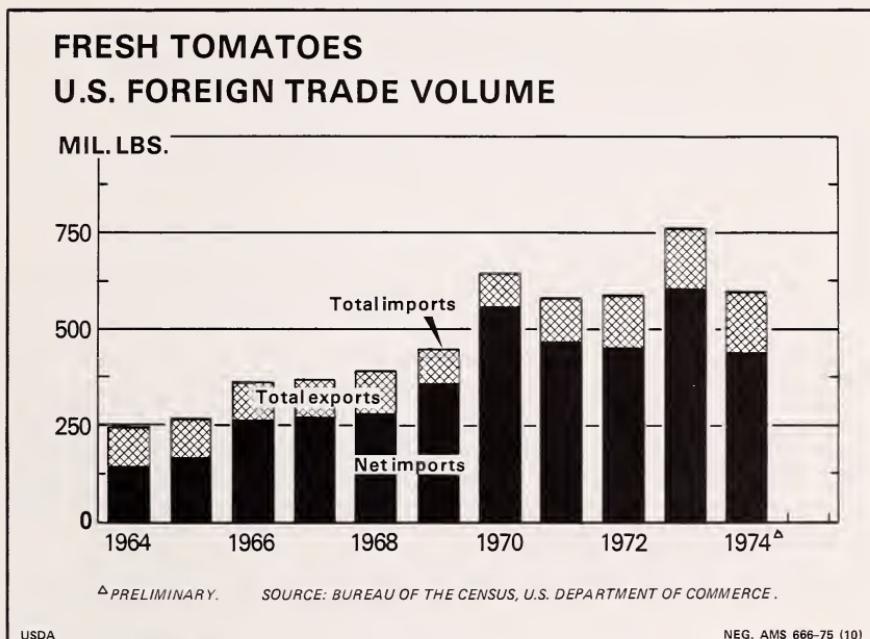
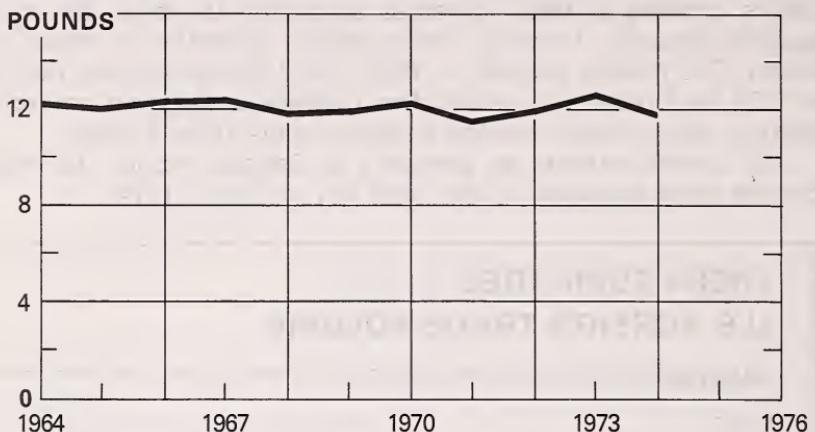


Figure 4

Total supply

Because of increasing fresh tomato imports, total supplies on the U.S. market rose at an average rate of 1 percent annually during the 1964-74 period. This was sufficient to maintain per capita consumption at a level of 12 pounds (fig. 5).

FRESH TOMATOES PER CAPITA CONSUMPTION



SOURCE: ECONOMIC RESEARCH SERVICE, USDA.

USDA

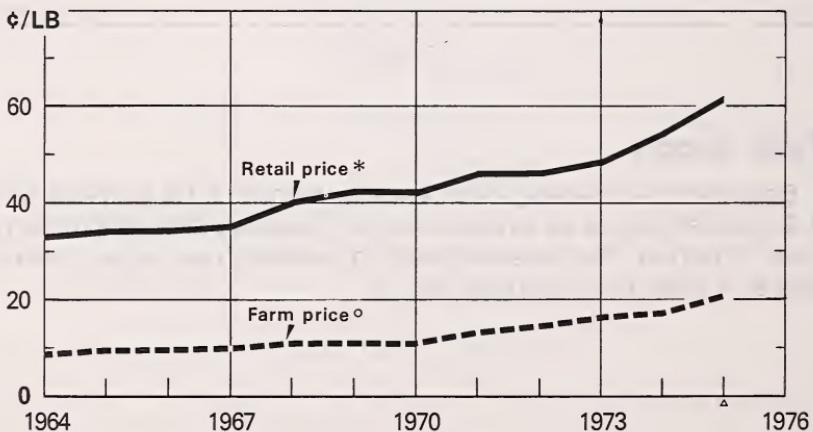
NEG. AMS 652-75 (10)

Figure 5

Prices

Prices to growers for tomatoes sold for fresh market use are reported by USDA's Statistical Reporting Service on a basis of

FRESH TOMATOES: FARM AND RETAIL PRICES



*AVERAGE BASED ON RANDOM SAMPLES FROM STORES IN 56 CITIES DURING FIRST FULL WEEK OF EACH MONTH, BUREAU OF LABOR STATISTICS, U.S. DEPT. OF LABOR.

°SEASON AVERAGE F.O.B. SHIPPING POINT PRICE. △JAN.-SEPT. 15, 1975 DATA.

USDA

NEG. AMS 705-75 (10)

Figure 6

"free on board (f.o.b.) shipping point." Prices at this level moved up sharply during the past decade—from a U.S. average of 9.4 cents per pound in 1965 to 17.3 cents in 1974 (fig. 6). The higher unit returns boosted total crop value by 78 percent from 1965 to 1974. Among the principal vegetables, excluding potatoes, fresh tomatoes rank second in total value, exceeded only by lettuce.

The uptrend in prices is closely associated with rising production and marketing costs. Detailed cost data for Florida tomatoes show that costs for growing mature green tomatoes in 1973-74 were a third higher than in the mid-1960's. During the same period the costs of harvesting, grading, packing, and selling the tomatoes at shipping point rose about 70 percent.

At the retail level, tomatoes generally are sold on a basis of weight (cents per pound for loose tomatoes) or unit (cents per tube or small basket). A more complex pricing system prevails at shipping point and wholesale markets, where tomatoes are sized and sorted into different levels of quality based on the U.S. grade standards. (Neither size nor grade is usually shown on tomatoes at the retail store.)

Size is generally the most important consideration in pricing at shipping point and wholesale. For a given grade, the largest tomatoes sell at the highest price. And large U.S. No. 2 grade tomatoes are priced above small U.S. No. 1 grade tomatoes. The price spread between sizes is largest during periods of normal or light supplies, but narrows appreciably when supplies are heavy. Because of changes in supply, tomato prices are highly volatile, reflecting an inelastic demand in the short run. During 1974, week-to-week changes in shipping point price ranged up to 60 percent, but averaged 15 percent.

MARKETING PRACTICES

Harvesting

Most commercially grown tomatoes are harvested as either "mature green" or "breakers." A mature green tomato has a completely green skin but has reached the stage where it will turn red either on or off the vine. A breaker is a tomato in the first stage of changing color; it is primarily green with a tinge of yellow or pink, usually at the blossom end. Breakers are commonly termed "vine ripe" in the tomato industry. (Throughout this publication, vine ripe is used to refer to tomatoes harvested as breakers; for tomatoes grown in home gardens, vine ripe usually means tomatoes which are allowed to develop the full red color on the vine.) (See fig. 12.) Mature green tomatoes and breakers are firm enough to withstand frequent handling during the marketing process and the time and travel necessary to get to market. Once mature green tomatoes or breakers are fully ripe, it is impossible to tell at which stage they were harvested.

When tomatoes are harvested mature green, a field usually is picked two or more times at 4- to 10-day intervals, depending on weather and market conditions. While most of the tomatoes are mature green, some have reached the breaker or riper stage. The tomatoes are transported to the packinghouse in field boxes holding up to 70 pounds. However, use of bulk bins holding several hundred pounds has become widespread in Florida and California.

When harvested vine ripe, tomatoes are picked daily or every 2 days. Frequent harvest is necessary to avoid ripe tomatoes which are soft and cannot be shipped to distant markets without heavy losses. Vine ripe tomatoes typically move in field boxes to packinghouses.

FRESH TOMATOES PACKING OPERATION

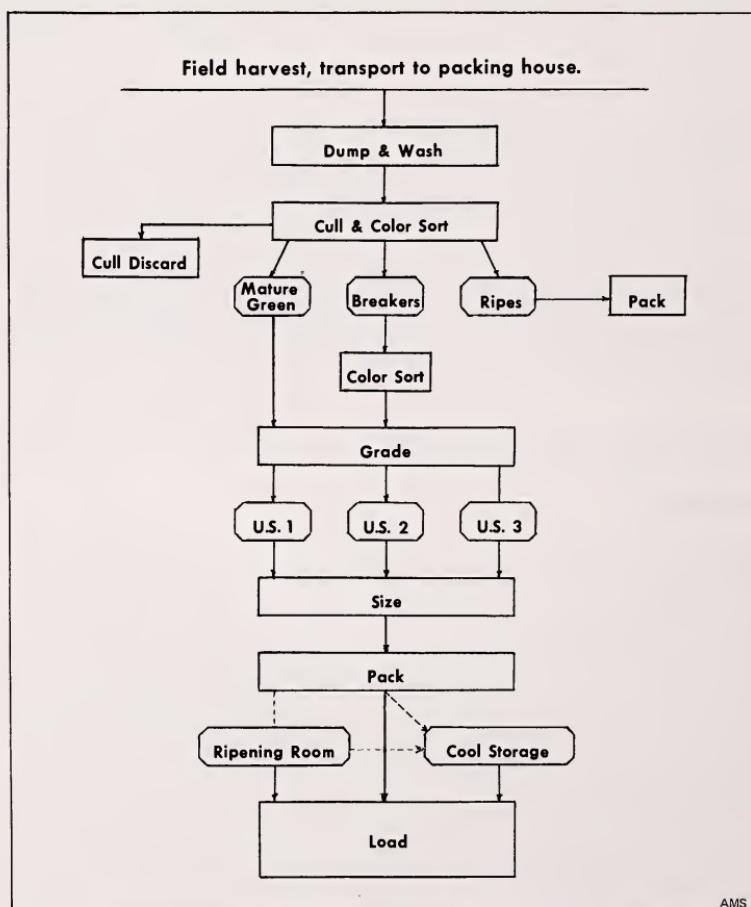


Figure 7

Packinghouse operations

The packinghouse is the assembly point for preparing and shipping tomatoes to market. Packinghouse operators usually handle tomatoes for many growers. Some growers have their own packing and shipping operations.

At the modern packinghouse, tomatoes are dumped into a tank of water and washed. (See fig. 7). They then move over a series of belts and are sorted by hand for color and grade, and by machine for size. When a basically mature green lot of tomatoes is being prepared for market, breakers and riper tomatoes are sorted out and run over a separate series of belts for grading and sizing. These tomatoes are segregated into several color classifications so that the tomatoes in each container are nearly uniform in color. This aids in distributing the commodity since the riper tomatoes usually go to nearby outlets.

Tomatoes are graded by the quality characteristics of firmness, shape, and freedom from defects such as decay, sunscald, scars, or bruises (fig. 8). A common practice is to grade tomatoes so that a given lot will contain a specified percentage of U.S. No. 1. Thus, when a packing firm desires an 85-percent No. 1 pack, sufficient numbers of undergrade tomatoes will be removed from the lot to meet the target.



Figure 8

The final sorting is for size, whereby tomatoes pass over a series of belts with holes having specified minimum diameters (fig. 9). Typically, the openings have a diameter of 2-4/32 inches on the first belt and a diameter of 2-9/32 inches on the second. Tomatoes falling through the second belt would be over 2-4/32 inches in diameter but no larger than 2-9/32 inches, and would be classified as "small." There are six size designations specified under U.S. grade standards.

At the end of the packing line, tomatoes are placed in containers which usually are stamped to indicate the tomato size. A variety of containers are used, but among the more common are fiberboard cartons holding 30 pounds of jumble-packed mature greens or about 20 pounds of place-packed vine ripes. Recent experimental shipments indicate that it would also be economical to jumble pack the riper tomatoes without incurring any loss in quality.

In some producing areas, the ripening process is accelerated before shipment. Cartons of mature green tomatoes are placed in closed rooms under conditions of controlled temperature and pressure. Ethylene—an organic compound which also comes from fruit during the ripening process—is introduced into the atmosphere and hastens the degreening or ripening process. When the tomatoes begin to show color, they are shipped to market. Ethylene is used widely in Florida and used to some extent in California and Mexico. Although ethylene speeds ripening, it has no effect on the flavor or nutritional value of tomatoes.



Figure 9. Equipment for sizing tomatoes.

MARKET CHANNELS

Packed tomatoes are transported to terminal (wholesale) markets primarily by truck, though rail transport is used for California, Florida, and Mexican tomatoes shipped to the larger cities in the Midwest and Northeast (See fig. 10). Overall, about 88 percent of the fresh tomatoes move to market by truck. Refrigeration is commonly used except in the coldest months, and portable ethylene generating equipment is sometimes used to accelerate ripening during transit.

Many mature green tomatoes are shipped to repackers in termi-

FRESH TOMATOES FROM SHIPPING POINT TO CONSUMERS

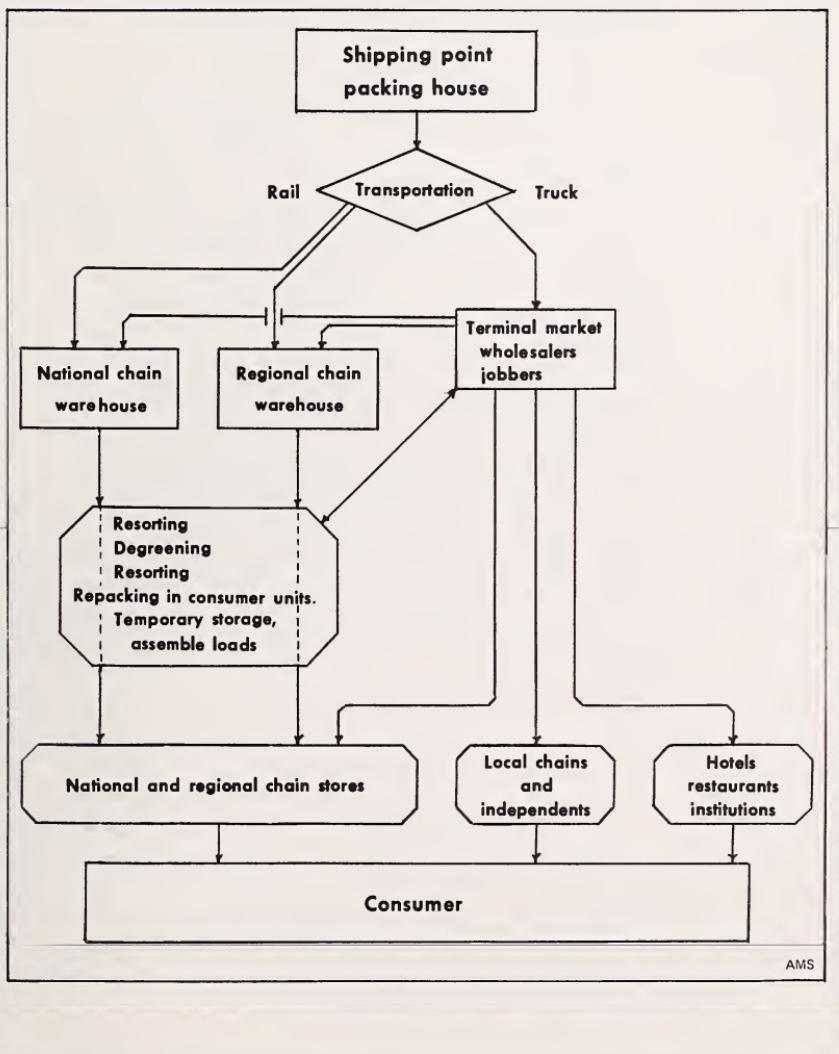


Figure 10

nal markets who specialize in ripening and resorting tomatoes for color uniformity. Larger chains have their own ripening facilities, but also acquire significant quantities from repackers. In recent years, about two-thirds of all mature green tomatoes were shipped to independent repackers, and one-third to chains. An increase in ripening facilities in Florida has reduced the quantity of tomatoes moving through the repackers.

Although some repackers also handle vine ripe tomatoes, most of this fruit is shipped directly to chainstore warehouses or to jobbers who distribute the tomatoes to retail outlets. Most of the tomatoes are sold under contractual arrangements with shipping-point marketing firms which grade and pack the tomatoes, then arrange the terms of trade with local buyers or customers in terminal markets. This method of sale is predominant in California, Florida, and other States some distance from the major terminals. A large portion of vine ripe tomatoes in Arkansas and New Jersey moves through nearby auction markets. Direct sales to retailers and to consumers at roadside stands are more common in the northern producing States.

Nearly all shipping point trading is conducted by telephone, and market activity is governed by custom, trade ethics, and trade laws. Buyers and brokers in the production areas can purchase on the basis of their actual inspection of the tomatoes being traded. A significant portion of the supply is traded on the basis of U.S. grades of fresh tomatoes as determined by the Federal-State Inspection Service. This grade certification also ensures against unwarranted claims regarding the quality and condition of merchandise.

Federal-State Market News Service reports are used by the industry to evaluate tomato supply and demand. Data on shipments, supplies, unloads, prices at various shipping points and terminal markets, weather conditions, and other information is provided the industry on a timely basis. In many producing areas, the information is disseminated rapidly by telephone recordings and radio. Summary material published daily and seasonally provides benchmarks for trading.

The Federal-State Inspection and Market News Services are provided by the Agricultural Marketing Service in cooperation with State agencies, usually the State departments of agriculture. Supply estimates are also made by crop reporting services in the various States in cooperation with USDA's Crop Reporting Board. In Florida, a weekly inventory of acreage is published each season which shows plantings by area, stage of growth, and number of pickings. For other States, acreage is reported periodically during the season, with production and value data published annually.

STATE INDUSTRIES

Essentially the same commercial production and handling practices are used for fresh tomatoes throughout the United States. Yet each State's industry has unique characteristics—in trend of production, type or maturity of tomatoes harvested, method of packing and selling, or principal area of distribution.

FLORIDA

Florida provides one-third of the U.S. annual production of fresh

FLORIDA: FRESH MARKET TOMATO PRODUCTION AREAS



SOURCE: FOOD AND RESOURCE ECONOMICS DEPARTMENT, UNIVERSITY OF FLORIDA; AND FLORIDA CROP AND LIVESTOCK REPORTING SERVICE, FLORIDA DEPARTMENT OF AGRICULTURE.



Green.



Breaker.



Turning.



Pink.



Red.

Figure 12. Typical examples of tomatoes in various stages of ripening. As tomatoes change color, they become softer and therefore more easily injured during marketing. Vines on right show tomatoes as they might appear in a home garden.



tomatoes, and is the major domestic source between October and June.

The crop in Florida is grown in five general districts (fig. 11). These districts and their harvested acreages in the 1974-75 season were:

Districts	Acres
Dade County	8,440
Fort Pierce-Pompano (Southeast coast)	4,990
Fort Myers-Immokalee (Southwest)	6,670
Palmetto-Ruskin (West coast)	10,950
Oxford and Florida Panhandle	450
Total acres harvested	<u>31,500</u>

In the October 1974-June 1975 marketing year, Florida growers and shippers marketed 8 million hundredweight (fig. 13) of fresh tomatoes at an average price of \$19.10 per hundredweight. The total value of sales (f.o.b. shipping point) was \$152.4 million.

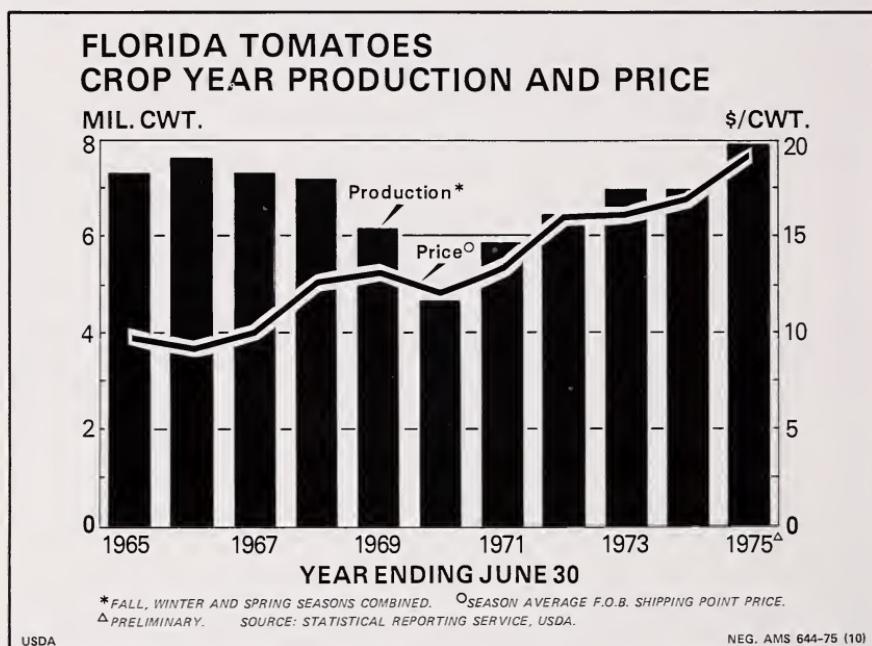


Figure 13

Harvest begins in the Palmetto-Ruskin and Fort Pierce areas in the fall, then moves south with Dade County dominating the harvest from January through March. As temperatures rise seasonally, harvest gradually moves back north and reaches its spring peak in Palmetto-Ruskin during May, and the Oxford area in June.

The Florida tomato industry experienced major structural changes during the 1965-75 period as it adapted to intensive competition from imports. As the period began, production of vine ripe tomatoes was at a peak, and accounted for about one-fourth of Florida's total output. But this segment of the industry declined as shrinking labor supplies, rising imports, and urban development

on the more productive farmlands made vine ripe production unprofitable. By 1975 only one major farm was still using the vine ripe type of culture. Producers of mature green tomatoes also encountered economic pressures. However, they adopted new cultural practices, including new varieties, heavier plant populations, and plastic mulch, which kept them competitive.

Florida tomatoes are marketed under a Federal marketing order which usually establishes minimum quality and size standards, requires tomatoes to be packed in specific size categories, and limits the number of container sizes which may be used. In the 1974-75 season, marketing order regulations required all tomatoes to be U.S. No. 3 grade or better and over 2-4/32 inches in diameter. Different sizes of tomatoes had to be packed separately, although the largest tomatoes could be commingled. This sizing is done so there is a uniform product moving through market channels, providing a more realistic basis for pricing. Marketing order regulations in effect for Florida also apply to imports (see Imports, p. 27).

Distribution, mainly by truck, is nationwide but is concentrated in the eastern half of the United States. The five largest markets in terms of volume of tomatoes handled in 1974 were New York, Boston, Philadelphia, Columbia, S.C., and Chicago. During most of its season, Florida encounters strong competition from imports, mainly from Mexico.

CALIFORNIA

About one-third of the Nation's supply of fresh tomatoes originates in California. Total fresh tomato acreage in California has

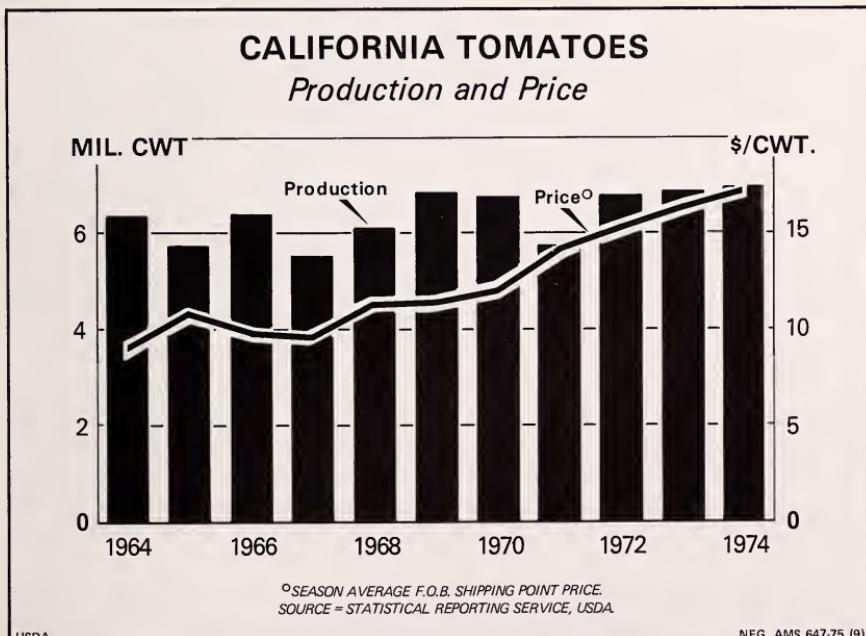
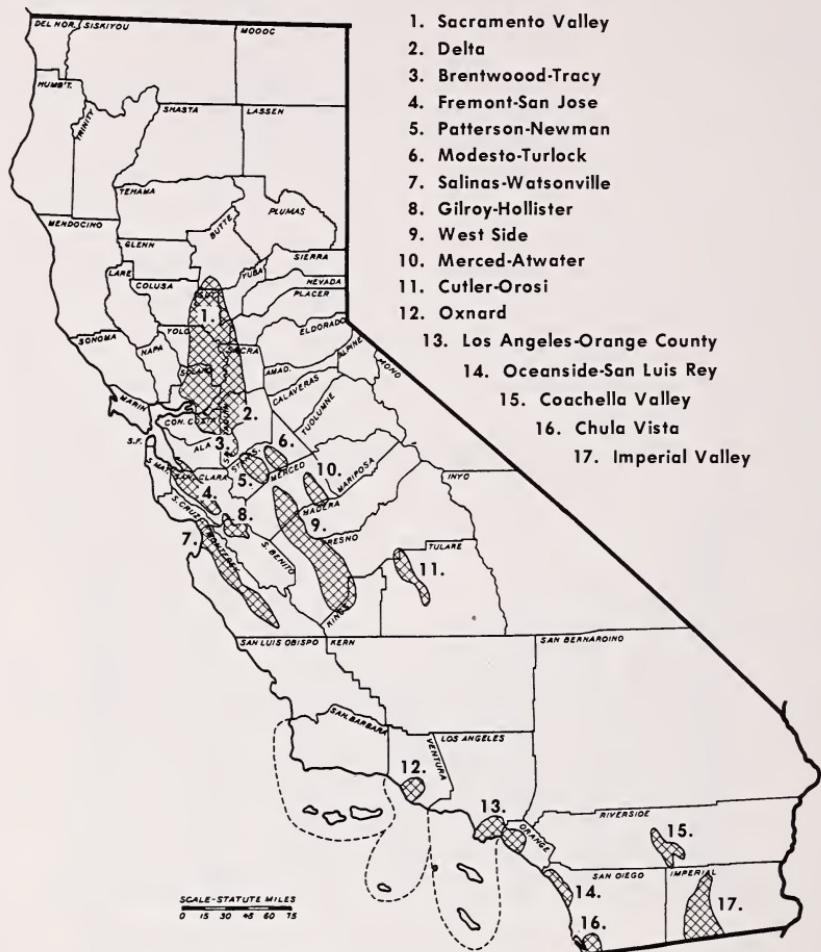


Figure 14

CALIFORNIA: FRESH MARKET TOMATO PRODUCTION AREAS



SOURCE: CALIFORNIA CROP AND LIVESTOCK REPORTING SERVICE, CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE; AND STATISTICAL REPORTING SERVICE, USDA.

UNITED STATES DEPARTMENT OF AGRICULTURE

NEG. AMS 687-75 (6) AGRICULTURAL MARKETING SERVICE

Figure 15

been fairly stable during the past decade. Yields have ranged widely in response to weather, but have been high in recent years. The 7.4 million hundredweight produced in 1974 (fig. 14) was 7 percent larger than in 1973, and 14 percent above the 1968-72 average.

Although many counties in California report commercial fresh market tomato production, eight counties produce the bulk of the crop (fig. 15).

County	Percentage of California fresh tomato acreage, 1973
San Joaquin	17.0
San Diego	14.3
Stanislaus	13.0
Merced	12.4
Monterey	12.4
Ventura	8.3
Imperial	6.3
Tulare	5.1
Other Counties	11.2

Nearly two-thirds of California's acreage is devoted to mature green tomatoes and the rest to vine ripe. However, production of the two types is about equal because of the higher yields of vine ripes. There has recently been a shift away from vine ripe production (mostly in coastal areas) to mature green culture. This trend is associated with lower production and handling costs for greens.

The harvest season usually begins in late April and increases to a peak in October, with some supplies available into early December. A large portion of the early crop moves to western markets, but the area of distribution widens as the season progresses. California is an important supplier to eastern markets by late summer, and is the dominant U.S. source of fresh tomatoes in October.

The Federal-State Market News Service reported that shipments of California fresh tomatoes in 1974 amounted to 16,814 carlot equivalents, up slightly from 1973. Almost three-fourths of the total shipments were in trucks and the remainder by rail.

NEW JERSEY

New Jersey was third in rank among the States in the 1972-74 average production of fresh tomatoes. Although some of New Jersey's commercial fresh market tomatoes are grown in several northern and central counties, close to three-fourths of the acreage is located in the southern counties of Salem, Gloucester, and Cumberland. Harvest is usually underway by early July with a rapid buildup to a seasonal peak in August. Volume decreases sharply in September, with only light supplies during October. In addition to the field-grown crop, a relatively small volume of tomatoes is grown in greenhouses. Harvesting extends from mid-April to mid-July.

Substantial quantities of New Jersey's fresh market tomatoes are sold on auction markets, and many are sold at roadside stands and through wholesale marketing firms. Sales consist almost entirely of vine ripe tomatoes. In recent years, the 30-pound carton jumble pack container has become increasingly popular, although ½-bushel baskets continue to be used in local trade.

Nearby cities are the main wholesale markets for New Jersey tomatoes, with Philadelphia leading by a wide margin over New York City. Principal competitors in these markets include Arkansas, Virginia, Maryland, and California. In May and June, New Jersey

FRESH TOMATOES: PRODUCTION AND PRICE

(Part 1: N.J., ALA., TEX., S.C., MICH., VA.)

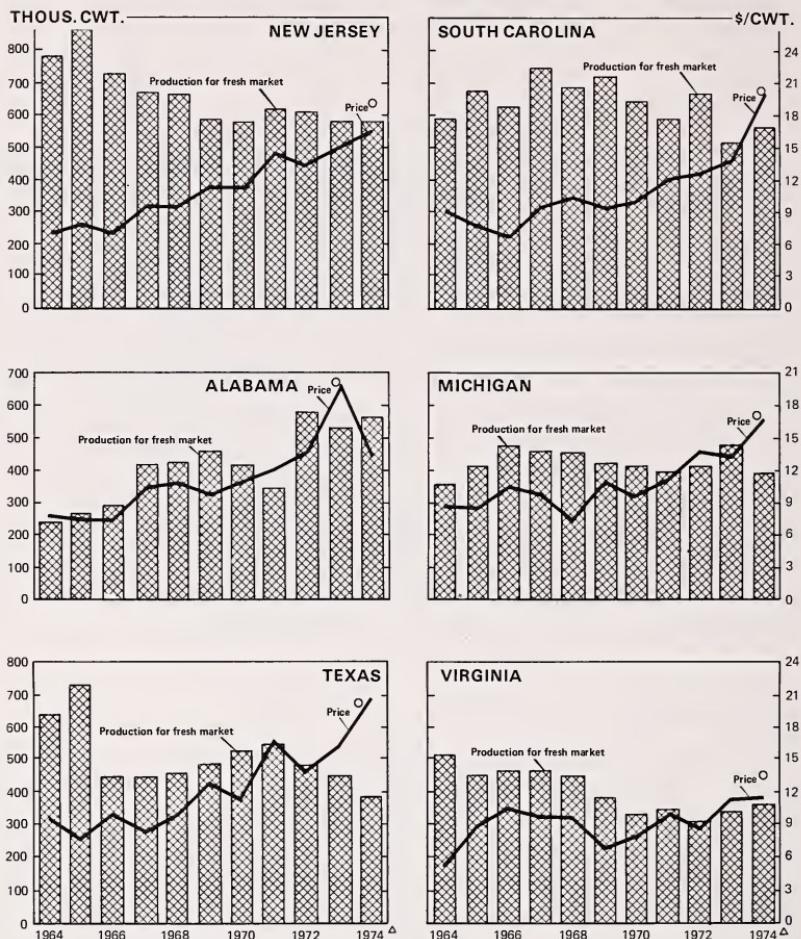


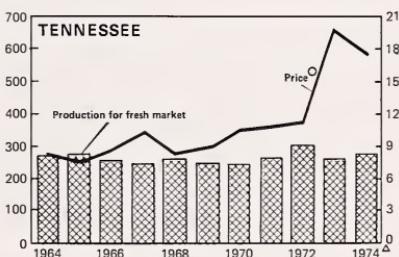
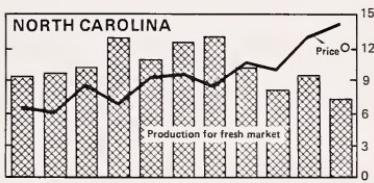
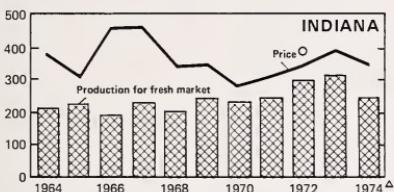
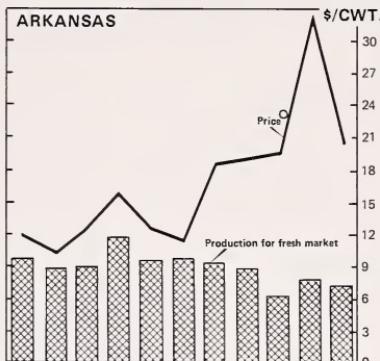
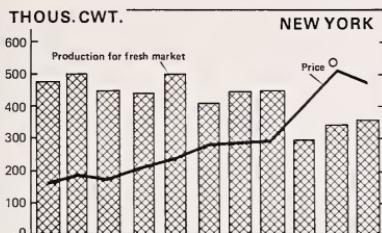
Figure 16

greenhouse tomatoes face competition from Ohio greenhouse supplies as well as field-grown tomatoes from Florida, South Carolina, and Mexico.

In recent years, New Jersey's production has shown a moderate decline. Production in 1974, at 576,000 hundredweight, was about the same as in 1973 but 5 percent under the 1968-72 average. Fresh tomato production and price for New Jersey tomatoes and other principal producing States are shown in figure 16. Data on other States are shown in figure 17.

FRESH TOMATOES: PRODUCTION AND PRICE

(Part 2: N.Y., IND., ARK., N.C., TENN.)



○SEASON AVERAGE F.O.B. SHIPPING POINT PRICE.

△PRELIMINARY.

SOURCE: STATISTICAL REPORTING SERVICE,
USDA.

Figure 17

SOUTH CAROLINA

Tomato production in South Carolina is largest in the southern coastal area (Charleston and Beaufort Counties) which accounts for over four-fifths of the State's total acreage. Harvesting usually begins in late May and is most active during June and early July. Grower-shippers handle the bulk of these tomatoes, which are picked mature green and go primarily to eastern cities. Almost one-third of the crop moves by truck to Columbia, S.C.—a large assembly point for redistribution in the Carolinas, Tennessee, Kentucky, and West Virginia. Principal out-of-State destinations in 1974 included New York City, Boston, and Philadelphia.

Another area of commercial production is in the central part

of the State near Columbia. Harvest is at peak during the summer, with the bulk of the crop sold locally.

Despite a modest uptrend in plantings, the output of fresh market tomatoes in South Carolina has declined due to low yields. Production in 1974 amounted to 552,000 hundredweight, 8 percent more than in 1973 but 8 percent below the 1968-72 average.

ALABAMA

Fresh market tomatoes in Alabama originate in widely separated areas adjoining four of the State's principal cities—Mobile, Dothan, Montgomery, and Birmingham. Harvest usually begins in June with volume peaking during July. Sizable shipments continue through September.

Alabama's fresh tomatoes generally are harvested at the breaker or riper stage and many are sold in nearby southern cities. In 1974 Birmingham was the principal outlet and Atlanta ranked second.

In the past decade, production in Alabama has shown a pronounced upward trend, reflecting additional plantings. Average yield per acre has held within a narrow range. Production in 1974 totaled 532,000 hundredweight, 2 percent above 1973 and 12 percent above the 1968-72 average.

MICHIGAN

Fresh market tomato production is concentrated in the southwestern part of the State near the Lake Michigan industrial complex. Berrien County ranks first in total acreage by a wide margin. A sizable acreage is also grown in the Detroit area. Michigan's tomato shipments peak during August and extend into October, or until the first frost. Tomatoes are marketed almost entirely in the vine ripe stage. Shipping containers used include crates holding eight 2-quart baskets (approximately 30 pounds), and 10- and 20-pound cartons.

Many Michigan growers sell their tomatoes wholesale on the Benton Harbor Fruit Market, a major assembly market in southwestern Michigan. Nearly one-half of Michigan's output moves into Detroit and Chicago. Some early supplies are usually marketed in eastern seaboard cities.

During the past decade, total fresh market tomato production in Michigan has seldom been below 400,000 hundredweight, with occasional crops amounting to 500,000. Although the total acreage planted has declined, improved cultural practices have contributed to an increase in average yield per acre.

TEXAS

Most of Texas' commercial crop originates in the Lower Rio Grande Valley but some tomatoes are produced in the Upper Coast and Central-East Texas areas, the High Plains, and northern

Texas. Supplies are available in commercial volume in all seasons except the late winter. Marketings are heaviest during June and July.

The bulk of Texas tomatoes are handled by shipping point firms and are shipped to wholesale outlets within the State. However, some supplies move in interstate trade.

During the late 1950's and early 1960's, there was a persistent decline in the Texas tomato industry. Since 1966, annual output has ranged between 440,000 and 550,000 hundredweight.

VIRGINIA

Nearly three-fourths of the total tomato acreage in Virginia is located in the Eastern Shore Counties of Northampton and Accomack. Most of the remainder is within a 50-mile radius of Richmond.

On the lower Eastern Shore, a few fields are generally ready for harvest by late June, but the bulk of the commercial crop is harvested in July. Virginia's tomatoes are marketed in both the vine ripe and mature green stages. Vine ripes destined for distant markets typically are hand-packed in 8-quart baskets. The mature greens are packed in 30-pound cartons.

Wholesale markets for Virginia's fresh tomato crop are mainly eastern seaboard cities, with substantial volume sold in New York City. Virginia is an important supplier during July in Baltimore, Boston, and Washington, D.C.

Fresh tomato acreage in Virginia in recent years has been substantially below that of the late 1960's. Although there has been a slight uptrend in yield, the 1972-74 average production of 332,000 hundredweight was nearly one-third less than the 1964-66 average.

ARKANSAS

Fresh market tomatoes are grown primarily in three areas in Arkansas. The southeastern area, centered in Bradley, Drew, and five surrounding counties, produces nearly 90 percent of the State's total output. Crawford County in the northwestern corner of the State is another source, and a small volume is grown in Searcy County in north central Arkansas.

Tomato production has typically been a family enterprise in the southeast, with generally less than 5 acres per farm. Most tomatoes were picked vine ripe, packed in 20-pound paperboard boxes at the farm, and trucked to auction markets operated by cooperative associations. However, in 1974 two large grower-shippers began operations in the area.

Plantings of 20 or more acres per farm are reported in the northwestern area, with the vine ripe crop usually grown under contract with marketing firms. Tomatoes in the north central area are harvested at the mature green stage and sold to a packing company.

Fresh tomatoes from Arkansas are shipped by truck to wholesale markets in cities throughout the Midwest and eastern Canada. Principal destinations include Philadelphia, Chicago, Nashville, Detroit, and Montreal. Growers plant an average of 4,500 total acres. Due to wide variations in yield, production ranges from 325,000 to 425,000 hundredweight annually (fig. 17).

NEW YORK

Fresh tomato producing areas in New York State are located primarily in counties bordering the Great Lakes, but some supplies originate in the central part of the State, the Hudson Valley, and on Long Island. Although light supplies are generally available from Long Island in late July, statewide harvesting is not active until mid-August, the peak month for supplies. A fair volume continues through September.

Tomatoes are harvested at the vine ripe stage. Market outlets are confined almost entirely to those within the State, with important outlets at Buffalo and Albany. Principal containers used in the western region include bushel and ½-bushel baskets, as well as 8-quart baskets. Some tomatoes from Long Island are marketed in New York City in 30-pound cartons.

During the past several decades, there has been a marked decrease in the relative importance of the fresh tomato industry in New York State. Acreage and production levels in the mid-1960's ranged well below those in the mid-1950's, and further decreases have occurred in recent years.

NORTH CAROLINA

Fresh market tomato supplies originate in the western part of the State, the Piedmont area, and in several eastern counties. However, the western area encompassed by Hagwood, Buncombe, and Madison counties is the major source.

Most of the crop in the western area is trellis-grown, and about three-fourths of the crop in the Piedmont area is stakegrown. Less intensive practices are used in the eastern counties.

Although fresh tomato marketings from North Carolina are more or less continuous during the summer, there are two distinct peaks. The first occurs in early July when crops in the eastern area are being harvested. The second period of active harvest extends from mid-July through September.

Most tomatoes are marketed in the vine ripe stage. In the early areas, some producers pack tomatoes in 20-pound fiberboard containers for shipment to distant markets, while bushel containers are commonly used for local sales. Most of the western crop is packed in 20-pound fiberboard containers after being sized, graded, and wrapped.

North Carolina's tomatoes are trucked to wholesale markets in major cities east of the Rocky Mountains. Leading markets include

Columbia, S.C., New York City, Miami, Cleveland, Detroit, and Chicago.

There was a rapid uptrend in production in North Carolina to 400,000 hundredweight in the late 1960's due mainly to a shift in acreage to the western area where average yields are relatively high. However, output during the 1970's has held within a narrow range, around 300,000 hundredweight.

GREENHOUSE TOMATOES

In the 1969 Census of Agriculture, all States except Hawaii reported production of tomatoes under glass or plastic. There were 1,122 of these farms with a total growing area of 28.4 million square feet. Value of sales was \$19.3 million.

Ohio, Indiana, Massachusetts, Texas, California, and Nevada are the leading States in greenhouse tomato production. Ohio had 57 percent of the total, and Indiana, 9.4 percent.

Greenhouse producers usually plan for two crops a year—in the spring and fall. It is not economically feasible in most areas of the United States to produce greenhouse tomatoes for harvest during January and February due to light deficiencies and high fuel costs.

Greenhouse tomatoes are marketed in various types of packages, but the most common is a fiberboard basket holding 8 pounds of fruit. Due to relatively high production costs, greenhouse tomato producers have been under pronounced economic pressure from imported tomatoes. Also, increases in fuel costs are expected to intensify the unfavorable market situation for this type of tomato production.

IMPORTS

About 99 percent of the fresh tomatoes imported into the United States (fig. 18) originate in Mexico. The Dominican Republic and Canada ship most of the remainder. Import tonnage of fresh tomatoes from Mexico tripled between 1964 and 1973—from 246 million pounds to 749 million pounds. However, imports in 1974 were down.

Tomato varieties used in Florida grow well in Mexico, and production techniques are similar in both areas. The planting season extends from September into February, and harvest is most active from December to early June. Both the planting and harvest seasons coincide with those in Florida. Most of the Mexican tomatoes for export are harvested at the breaker stage; however, harvest at the mature green stage is increasing. A large quantity of cherry tomatoes is also exported.

Mexican tomatoes enter the United States primarily at Nogales, Ariz., where they are inspected for grade and size by U.S. inspectors. This inspection is to ensure compliance with minimum grade

FRESH MARKET TOMATOES

Principal Supply Sources

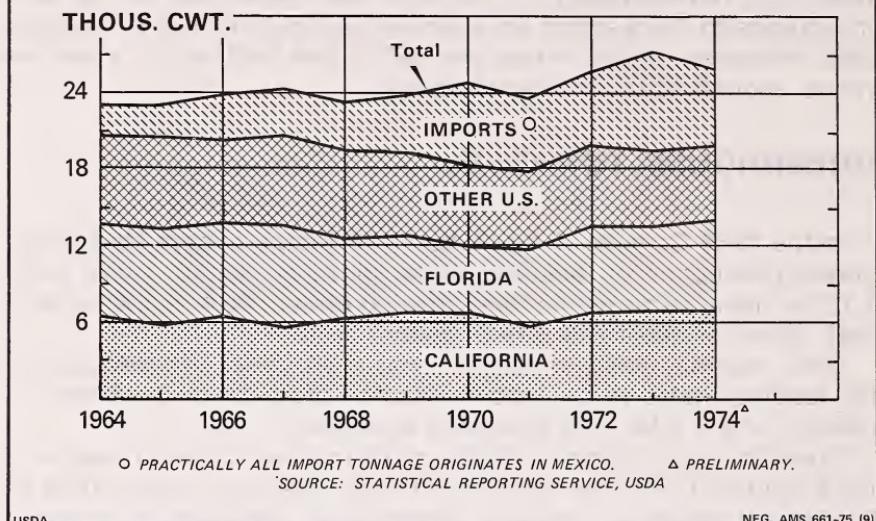


Figure 18

and size criteria authorized under Section 8e of the Agricultural Marketing Agreement Act, which requires imported tomatoes to meet any quality standards imposed on domestic (Florida) shipments under a marketing order. When no marketing order regulations are in effect, imports are still graded on a voluntary basis to provide Mexican shippers and U.S. importers a basis for trading. Tomatoes are sorted according to color in distributors' warehouses located on the American side of the border for reshipment to domestic outlets.

In Mexico, the production and marketing of fresh tomatoes for export is coordinated by the *Union Nacional de Productores de Hortalizas* (UNPH). UNPH has a program to control acreage planted, and the quality and volume of tomatoes exported. In recent seasons, when prices became depressed, these controls ranged from temporary suspension of harvesting and packing operations to limitations on the grades and sizes permitted to be exported.

Mexican tomatoes are packed in either two-layer flats (about 20 pounds net) or three-layer lugs (about 30 pounds net). In 1974, supplies of Mexican tomatoes were reported in all of the 41 U.S. and 5 Canadian cities for which data are compiled. Leading markets were Los Angeles, San Francisco, Chicago, Dallas, and New York.

BIBLIOGRAPHY

- Agricultural Marketing Service
1973. United States Standards for Grades of Fresh Tomatoes.
- Agricultural Marketing Service
Fresh Fruit and Vegetable Shipment Totals by Commodities, States, and Months. Annual Rpt.
- Agricultural Marketing Service
Fresh Fruit and Vegetable Unload Totals in 41 Cities. Annual Rpt.
- Agricultural Marketing Service
Fresh Fruit and Vegetable Unloads. Issues for Eastern, Midwestern, Southern, and Western Cities by Commodities, States, and Months. Annual Rpt.
- Agricultural Marketing Service
Summary of Wholesale Prices of Fresh Fruits and Vegetables at New York City and Chicago, and F.O.B. Shipping Point Prices at Leading Shipping Points. Annual Rpt.
- Bohall, Robert W.
1972. Pricing Performance in Marketing Fresh Winter Tomatoes. U.S. Dept. Agr. Mktg. Res. Rpt. 977.
- Brooke, D.L.
1975. Costs and Returns from Vegetable Crops in Florida, Season 1973-74 With Comparisons. Food and Res. Econ. Dept., Univ. of Fla., Gainesville, Fla.
- Brooker, John R.
1973. Systems Analysis of the United States Winter Fresh Tomato Industry. Doctoral Dissertation, Univ. of Fla., Gainesville, Fla.
- Cain, Jarvis L. and Toensmeyer, Ulrich C.
1969. Interregional Competition in Maryland Produced Fresh Market Tomatoes. Agr. Expt. Sta., Univ. of Md., College Park, Md.
- Dhillon, P.S. and Kirschling, P.J.
1971. Profitability of Tomato Production Under Plastic Greenhouses. Dept. Agr. Econ. and Mktg., Coop. Ext. Serv., Rutgers Univ., New Brunswick, N.J. A.E. 335.
- Ford, K.E.
1972. The Distribution of Tomatoes on the Fresh Market. Univ. of Ga., Agr. Expt. Sta. Ga. Res. Rpt. 119.

BIBLIOGRAPHY—cont.

- Garrett, J.T. and others
1967. Tomato Growing. Clemson Univ., Clemson, S.C. and U.S. Dept. Agr.
- Glasscock, M.R.
Fruit and Vegetable Marketing in Alabama. Coop. Ext. Serv., Auburn Univ., Ala. Circular R-25.
- Goble, William E.
1971. Description of the Fresh Tomato Industry in Tennessee. Univ. of Tenn., Knoxville, Tenn. Working Paper.
- Harsh, Stephen and others
1969. Economics of Tomato Production in Western Michigan. Dept. Agr. Econ., Mich. State Univ., East Lansing, Mich. Agr. Econ. Rpt. 26.
- Jackson, E.A. and Proctor, E.A.
1972. Description of North Carolina Fresh Market Tomato Industry. N.C. State Univ., Raleigh, N.C.
- Jesse, Edward V.
1974. Packing California Vine-Ripe Tomatoes: Costs and Efficiencies. U.S. Dept. Agr. Econ. Rpt. 275.
- Jesse, Edward V.
1975. Packing California Mature Green Tomatoes: Costs and Efficiencies. U.S. Dept. Agr. Econ. Rpt. 282.
- Longbrake, Tom and others
1972. Keys to Profitable Tomato Production in South and West Texas. Texas Agr. and Mech. Univ., College Station, Tex. Fact Sheet L-1045.
- New York State College of Agriculture and Life Sciences
1974. 1974 Vegetable Recommendations: Tomatoes. Dept. of Veg. Crops, Cornell Univ., Ithaca, N.Y.
- Price, Carter
1974. Structural Changes in Fresh Tomato Markets in Southeast Arkansas. *Arkansas Farm Research*, Vol. XXIII, No. 2.
- Price, Carter
1973. Evaluation of Marketing Procedures for Fresh Tomatoes in Southeast Arkansas. *Arkansas Farm Research*, Vol. XXII, No. 2.

Price, Carter

1971. Description of Arkansas Fresh Market Tomato Industry.
Univ. of Ark., Fayetteville, Ark. Unpub. Mscrpt.

Schmitt, John B. Jr. and Perkins, Frederick A.

1974. Marketing New Jersey Greenhouse Tomatoes. Dept. Agr.
Econ. and Mktg., Coop. Ext. Serv., Rutgers Univ., New
Brunswick, N.J. S.R. 27.

Sacket, Clarice

1975. Marketing Fresh Tomatoes. Untd. Frsh. Frt. and Veg.
Assn., Washington, D.C.

Statistical Reporting Service

1972. Vegetables for Fresh Market, Revised Estimates by Sea-
sonal Groups and States, 1964 through 1970. U.S. Dept.
Agr. Stat. Bul. 495.

Statistical Reporting Service

1974. Vegetables—Fresh Market, 1973 and 1974 Annual Sum-
maries. U.S. Dept. Agr.

Stoner, Allan K.

1971. Commercial Production of Greenhouse Tomatoes. U.S.
Dept. Agr. Agr. Hdbk. 382.

Watada, Alley E., Aulenbach, Barbara B., Worthington, John T.

1976. Vitamins A and C in Ripe Tomatoes As Affected by Stage
of Ripeness at Harvest and by Supplementary Ethylene.
Journal of Food Science, Vol. 41, No. 4.

Westcott, Edwin R.

1964. Costs of Ground and Staked Fresh Tomatoes, New
Jersey, 1961, 1962. N.J. Agr. Expt. Sta., Rutgers Univ.,
New Brunswick, N.J. A.E. 303.

